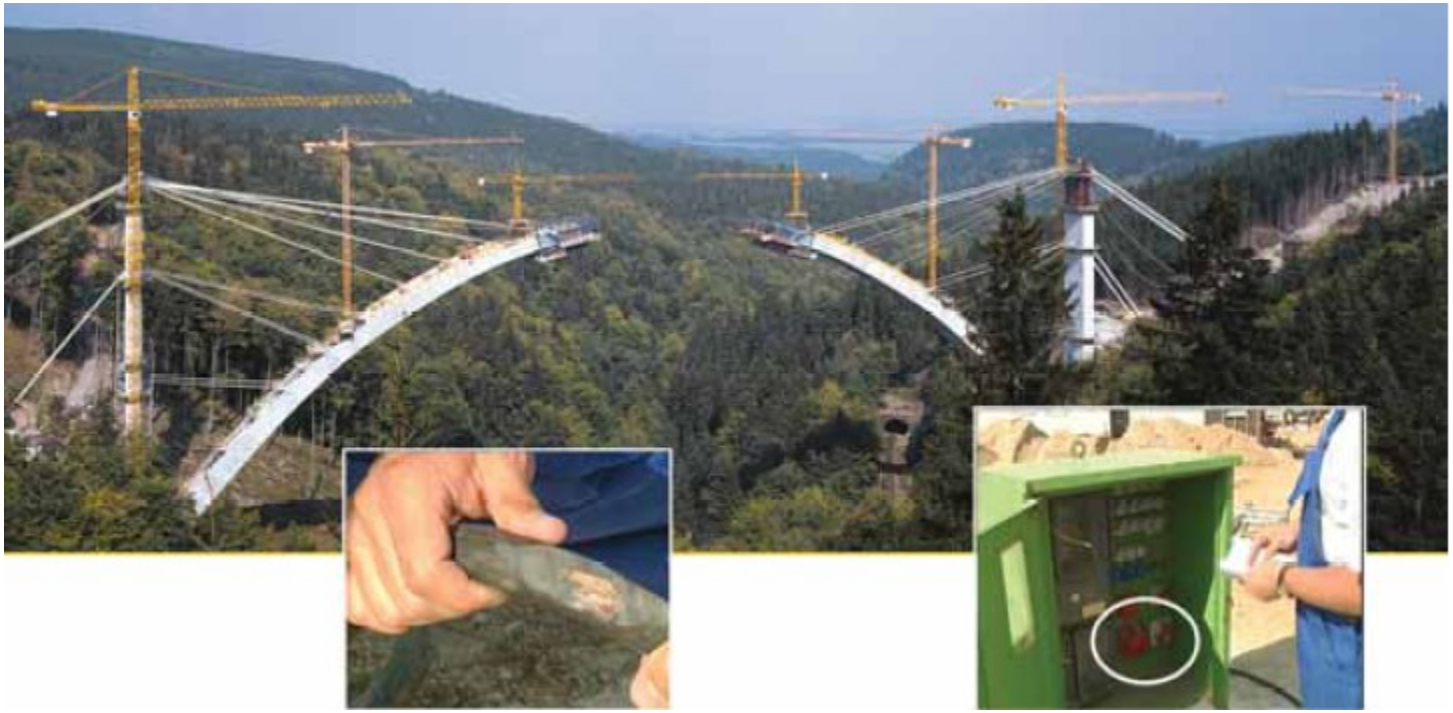
Selection and Operation of Electrical Systems at Construction Sites



Wolfgang Rieth

Dave Stanton

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Selection and Operation of Electrical Systems at Construction Sites

Continuous implementation, execution, and enforcement of required protective measures for the avoidance of electrical hazards at construction sites and pre-fabrication yards are the main focus to eliminate electrical related accidents

25% of Corps fatalities are from electrocution!

Selection and Operation of Electrical Systems at Construction Sites

- **Typical Problem Areas**

- **Electrical cords, connectors, distribution panels are not installed professionally or do not meet minimum requirements**
- **Damage of isolation due to heavy mechanical load**
- **Poor coordination**
- **Fast change of conditions (power need in various locations)**
- **Grounding**
- **Wrong distances to existing high voltage lines**
- **Log out Tag Out Procedure**

Selection and Operation of Electrical Systems at Construction Sites

- SAFETY AND HEALTH REQUIREMENTS MANUAL
- NATIONAL ELECTRICAL CODE (NFPA 70)
- OSHA PUBLICATIONS
- EUROPEAN ELECTRICAL Safety STANDARDS

  Betriebssicherheitsverordnung (Ordinance on Industrial safety and Health)

  BaustellV (Construction Site Ordinance) DIN-VDE, 0105 Part 100 and 0104

  BGV A3, Elektriche Anlagen und Betriebsmittel, BGI 608, 600, 594

Selection and Operation of Electrical Systems at Construction Sites

General Requirements (Germany)

Electrical system and equipment at construction sites and pre-fabrication yards must be made available and used according to the definitions of BGI 608 information and other generally recognized rules of the technology. Deviations from this BGI are permissible, if the same safety goals can be ensured in other ways.

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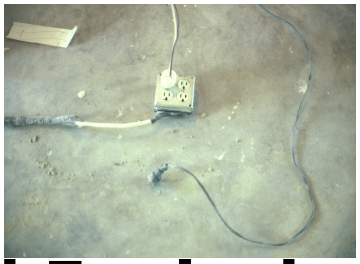
Selection and Operation of Electrical Systems at Construction Sites

Electrical systems and equipment must be selected with consideration of the conditions at construction site

- **Humidity**
- **Temperature**
- **Dust**
- **Mechanical Load**
- **Chemical Load**
- **Risks from Fire and Explosion**
- **Work in confined space or areas with high elektrischer leitfaehigkeit**



Selection and Operation of Electrical Systems at Construction Sites

Principals

- **Electrical supply only from certified Power Distribution Panel**
  - **construction distribution panels**
  - **mini construction distribution panels**
  - **insulating transformer**
  - **permanent outlets so far checked for this purpose and labeled**

Mögliche Speisepunkte: Baustromverteiler nach VDE 0660-501.

Ortsveränderlicher Trenntransformator in schutzisolierter Ausführung, Kennzeichnung der Anwendungskategorie gemäß BGI 600.

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Selection and Operation of Electrical Systems at Construction Sites

Need to meet

DIN VDE 0660-501

VDE 0612

FI < 30 mA

TESTING

MONTHLY by qualified Electrician

Kleinstbaustromverteiler mit Zusatzeinrichtung und dauerhaft angebrachten Sicherheitshinweisen auf der Türinnenseite.

Errichtungsprüfung an einem Baustromverteiler.

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- Some reality

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Selection and Operation of Electrical Systems at Construction Sites

- **Some reality**

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Selection and Operation of Electrical Systems at Construction Sites

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- **Some reality**

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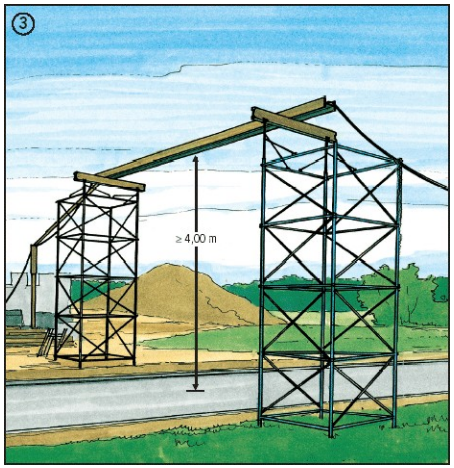
Selection and Operation of Electrical Systems at Construction Sites

Cables

- H07RN-F standard or equal
- To be protected while exposed to high mechanical load
  - Suspended
  - Covered by solid material (wooden ramps)
  - Routed through protection pipes or covered trenches

Leitungsschutz durch hochgelegte Leitungsführung (Kabelbrücke).



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Portable electric hand tools

- **IP 4X**
- **daily visual check**

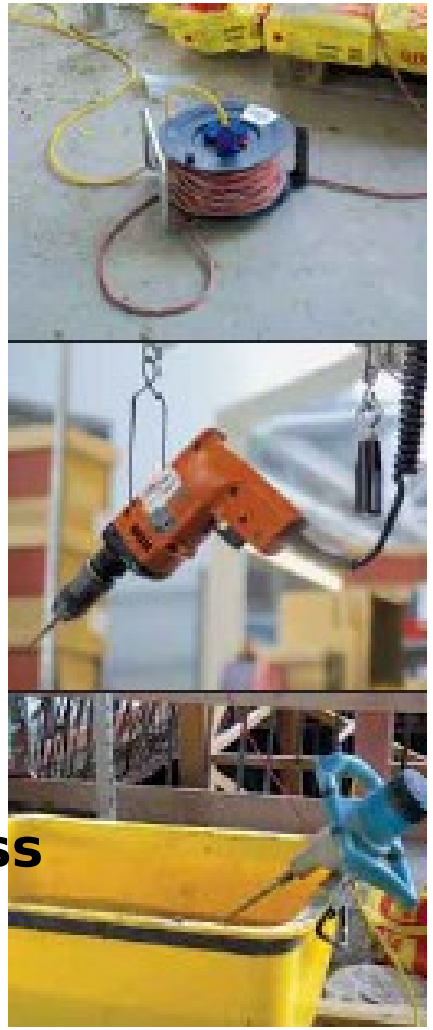
- **Semiannually by a qualified electrician**

Lights

- **Protection class IP 23**

- **VDE 0711 Part 1**

- **Hand and floor lights protection class IP 55**



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Selection and Operation of Electrical Systems at Construction Sites

- IP has two rating categories, X & Y
- X - Impact resistance
- Y - Water protection Identifier
- eg. IP 55 rated for dust and wet environment

(from all direction apprx 12 liter per min (Watering Hose)

Selection and Operation of Electrical Systems at Construction Sites

Questions?

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